

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Yurgelun-Todd et al. Confirmation No.: 5991  
Serial No.: 10/556,134 Art Unit: 1651  
Filed: February 12, 2007 Examiner: Aaron J. Kosar  
Customer No.: 21559  
Title: USE OF SECRETIN IN TREATMENTS OF DISORDERS  
ASSOCIATED WITH THE AMYGDALA

DECLARATION OF DR. DEBORAH A. YURGELUN-TODD UNDER  
37 C.F.R. § 1.132 TRAVERSING GROUNDS OF REJECTION

Under 37 C.F.R. § 1.132 and regarding the rejection of claims 1-7 under 35 U.S.C. § 112, first paragraph, for lack of enablement, I declare:

1. I am an inventor of the subject matter that is described and claimed in the above-captioned patent application. My curriculum vita is attached.
2. It is reasonable to conclude that secretin would be effective in treating a bipolar disorder. This opinion is based on my experimental observations that secretin modulates amygdalar activation in healthy patients, the knowledge that abnormal amygdalar function is implicated in bipolar disorder, and experimental observations of improvement in bipolar patients treated with secretin.
3. As described in the specification, we have performed experiments on functional magnetic resonance imaging (fMRI) of healthy control patients (page 12, line 12 – page 18, line 10). These fMRI experiments demonstrated that secretin alters amygdala responsiveness to affective stimuli. In addition, abnormalities of the amygdalar-frontal circuit have been implicated in a variety of behavioral and psychiatric disorders, including bipolar disorder (*see* page 1, line 14 – page 2, line 21).

4. In a double-blind crossover placebo-controlled study, we examined whether the administration of secretin results in mood stabilization. This study was conducted in eight male patients aged 18-40 years and meeting the diagnostic criteria for Bipolar I or II disorder (DSM-IV). The patients were in a mildly depressed phase of the illness during the study. Patients were allowed to continue their current treatment as usual pharmacotherapy. We administered clinical ratings, mood scales, and select neurocognitive measures designed to measure specific relevant domains both before and four hours following treatment with secretin or placebo. Although the investigation includes a double-blind placebo controlled visit, "placebo" in this case refers to the patient's standard pharmacotherapy with no secretin. Patients were administered a single dose of secretin equivalent to 1.0  $\mu\text{g/kg}$  intravenously. This treatment is generally described in the specification at pages 6-10. Vital signs were monitored following drug administration. As this was a double-blind study, the drug/placebo bags were randomized. Various clinical rating scales were administered to the patients, which included the Young Mania Rating Scale (YMRS), the Montgomery-Asberg Depression Rating Scale (MADRS), the Hamilton Depression Scale (HAM-D) scores, the Barratt Impulsivity Scale (BIS), the Profile of Mood States (POMS), the State-Trait Inventory (STAI), the Clinical Global Impression for Bipolar Patients (CGI-BP), and the Positive and Negative Affect Scale (PANAS). All patients were scanned using fMRI both before and after administration of the placebo or secretin. Baseline scanning included structural MRI and fMRI scanning on a 3T magnet. Following the first scanning session, patients were administered either placebo (saline) or a single infusion of secretin via an infusion. One hour after drug administration, patients underwent the second fMRI scanning protocol and were then re-assessed on the clinical rating scales. Within two weeks, patients repeated these procedures for study visit two and were administered either saline or secretin, whichever they did not receive in study visit one. During the fMRI part of the protocol, patients completed two challenge paradigms that included the presentation of happy, sad, fearful, and neutral faces, as well as more cognitively based tasks requiring the inhibition of overlearned responses, such as the Stroop test.

5. As shown in Figures 1 and 2 in the Appendix, patients were administered the Positive and Negative Affect Scale test. Negative symptoms were reduced after both placebo and secretin injection, where responses to the negative affect subscale after secretin injections suggested a trend toward significant improvement ( $p = 0.064$ ) (Figure 1 in Appendix). Responses to the positive affect subscale were essentially unchanged for the placebo injection but did appear reduced following secretin injection (Figure 1 in Appendix). Individual responses to the negative symptom portion showed that administration of a single dose of secretin produced some reduction of negative symptoms in four out of the six patients with bipolar disorder (Figure 2 in Appendix). It is not surprising that a subset of patients reported an observable clinical effect, as most treatment interventions have shown effects only on limited patient subgroups.

7. As shown in Figure 3 in the Appendix, patients were administered the Stroop Color Word Task test, which measures cognitive inhibition. The patients receiving secretin demonstrated improved performance on all three conditions of color naming, word reading, and interference following the secretin injection relative to baseline. However, only performance on the word reading condition reached statistical significance ( $p = 0.025$ ) (Figure 3 in Appendix). In contrast, following the placebo injection, no differences in performance were detected for any condition relative to baseline.

8. As shown in Figures 4 and 5 in the Appendix, patients were scanned using fMRI. These fMRI findings showed that secretin alters brain activation in multiple brain regions (Figure 4 in Appendix). In particular, administration of secretin increased amygdalar activation in bipolar patients, compared to administration of placebo (Figure 5 in Appendix). Along with the other structures identified, including the superior temporal gyrus and the cingulate gyrus, the amygdala is considered a key structure in emotional processing, and these findings suggest that secretin aids in the normalization of amygdalar response to emotional stimuli in a variety of conditions, in this case, bipolar disorder.

9. I have also reviewed the press release from the Repligen Corporation ("Repligen Licenses Patent Rights for 'Treatment of Bipolar Disorder,'" Mar. 31, 2009). This press release relates to a license agreement for intellectual property owned by The McLean Hospital Corporation, the assignee of this application. The press release states that "current therapies [for bipolar disorder] are ineffective and result in numerous side effects" and further explains that while "several therapies are approved for the treatment of bipolar disorder, many individuals are unable to tolerate treatment-related side effects." The press release indicates that treatments are available for bipolar disorder. The press release also corroborates our observation (as discussed above) that not all therapies work in all patients and that most therapies are only effective on limited patient subgroups. The press release does not call into question the effectiveness of secretin in treating bipolar disorder.

10. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

March 3, 2009  
Date

Dr. Deborah A. Yurgelun-Todd  
Dr. Deborah A. Yurgelun-Todd

## APPENDIX

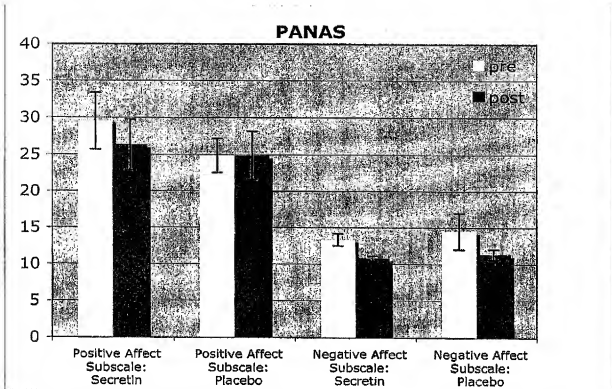


Figure 1. Scores on the Positive and Negative Affect Scale (PANAS) measured pre-administration (white) and post-administration (gray) with either secretin or placebo.

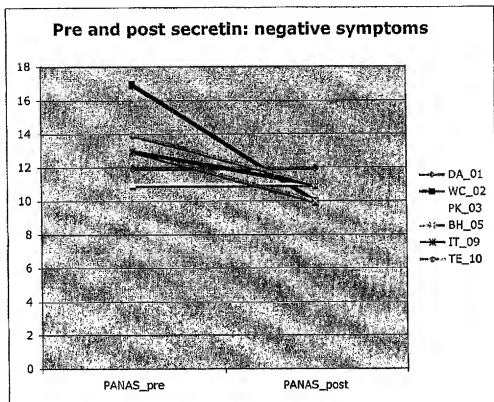


Figure 2. Individual responses to negative symptoms portion of the Positive and Negative Affect Scale (PANAS) measured pre-administration (labeled "PANAS\_pre") and post-administration (labeled "PANAS\_post") with secretin.

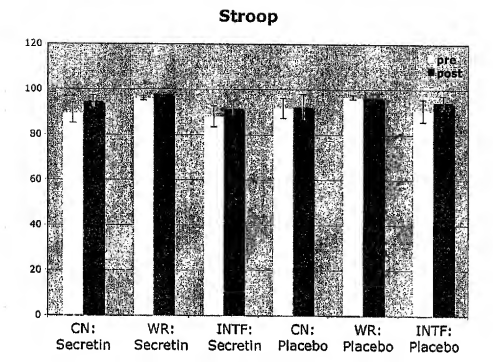


Figure 3. Performance on Stroop Color Word Task on conditions of color naming (labeled "CN"), word reading (labeled "WR"), and interference (labeled "INTF") relative to baseline, which were measured pre-administration (white) and post-administration (gray) with secretin or placebo.

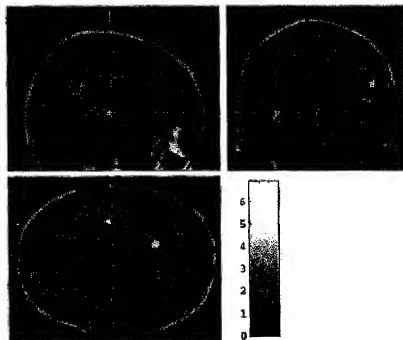


Figure 4. Whole brain SPM results for adult bipolar patients in response to fearful facial affect. Intravenous secretin administration produced higher activation in perception of fearful affect in multiple brain regions, including the left superior temporal gyrus, bilateral postcentral gyrus, and the right caudate, relative to placebo.



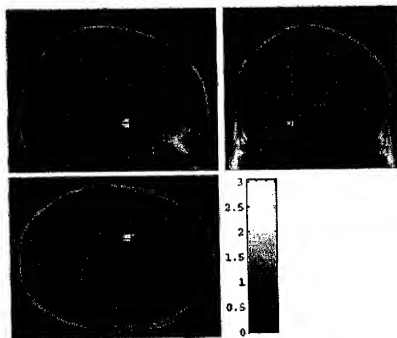


Figure 5. SPM results for amygdala activation in adult bipolar patients in response to fearful facial affect. Intravenous secretin administration produced higher activation in perception of fearful affect in the left amygdala relative to placebo.

## CURRICULUM VITAE

### PART I: General Information

**Date Prepared:** September 1, 2009

**Name:** Deborah Yurgelun-Todd

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University of Utah School of Medicine  
383 Colorow Drive  
Salt Lake City, Utah 84108

George E. Wahlen VAMC  
500 Foothill Drive  
Salt Lake City, UT 84108

**E-Mail:** deborah.yurgelun-todd@hsc.utah.edu

**Office Phone:** 801-587-1202 **FAX:** (801) 585-5375

**Place of Birth:** Boston, Massachusetts

#### Education:

1974	B.A. Mount Holyoke College, South Hadley, MA
1979	M.A. Boston College, Chestnut Hill, MA (Psychology)
1986	M.A. Harvard University, Cambridge, MA (Psychology)
1988	Ph.D. Harvard University, Cambridge, MA (Neuropsychology)

#### Postdoctoral Training:

1988-1990 Post-doctoral Fellow, Boston Neurobehavioral Institute

#### Licensure and Certification

1991	Massachusetts Licensed Psychologist (Neuropsychologist)
2008	Utah Licensed Psychologist (Neuropsychologist)

#### Academic Appointments:

1988-1995	Instructor of Psychology in the Department of Psychiatry, Harvard Medical School, Boston, MA
1996-1999	Assistant Professor of Psychology in the Department of Psychiatry, Harvard Medical School, Boston, MA
1998-	Lecturer in Psychiatry in the Department of Behavioral Neuroscience, Boston University School of Medicine, Boston, MA
1999-	Associate Professor of Psychology in the Department of Psychiatry, Harvard Medical School, Boston, MA
2008-	Research Associate, Department of Psychiatry, Harvard Medical School, Boston MA
2008-	Professor of Psychiatry, University of Utah School of Medicine

#### Hospital Appointments or Affiliated Institution Appointments:

1983-1988	Assistant Investigator, Laboratories for Psychiatric Research, Mailman Research Center, McLean Hospital, Belmont, MA
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1988-1992	Assistant Neuropsychologist, Neurology Department, McLean Hospital, Belmont, MA
1988-1995	Assistant Research Psychologist, Laboratories for Psychiatric Research, Mailman Research Center, McLean Hospital, Belmont, MA
1995-2004	Associate Research Neuropsychologist, McLean Hospital, Belmont, MA
2004-2008	Research Neuropsychologist, McLean Hospital, Belmont, MA
2008-	USTAR Investigator, University of Utah School of Medicine, Salt Lake City, UT
2008-	Clinical Neuropsychologist, Utah Neuropsychiatric Institute, Salt Lake City, UT
2008-	Health Science Specialist, VAMC, Salt Lake City, UT
2009-	Associate Director, MIRECC VISN 19, Salt Lake City, UT

#### **Hospital and Health Care Organization Service Responsibilities:**

1995-2008	Director of Neuropsychology, Brain Imaging Center, McLean Hospital, Belmont, MA
1998-2008	Director of Cognitive Neuroimaging, Brain Imaging Center, McLean Hospital, Belmont, MA
2008-	Director, Cognitive Neuroimaging, The Brain Institute, University of Utah, Salt Lake City, UT

#### **Major Administrative Responsibilities:**

2001-2003	Reviewer, NIH Scientific Review Group (ZRG1, BDCN-5, 6)
2004-	Reviewer, NIH Scientific Review Group (NPAS 1)
2004	Reviewer, NIH Scientific Review Group (ZMH1 NRB-Q (05))
2004	Chair, Mysell Committee, Harvard Medical School
2009	Reviewer, NIMH Board of Scientific Counselors for Intramural Clinical Research

#### **Major Committee Assignments:**

1998-	Mysell Committee, Harvard Medical School
1998-	Scientific Advisory Committee, Boston Environmental Hazards Center, Boston University School of Public Health

#### **Professional Society Involvement:**

1987-	International Neuropsychological Society
1992-	Massachusetts Neuropsychological Society
1993-	Society for Research in Psychopathology
1993-	International Society for Magnetic Resonance in Medicine
1994-	Society of Magnetic Resonance
1994-	Society of Biol Psychiatry
1996-	Society for Neuroscience
1998-	American College of Neuropsychopharmacology

#### **Editorial Boards:**

1988-	Ad hoc reviewer, Schizophrenia Bulletin
1989-	Ad hoc reviewer, Schizophr Res
1992-	Ad hoc reviewer, American Journal of Psychiatry

1994-	Ad hoc reviewer, Archives of General Psychiatry
1994-	Ad hoc reviewer, Psychiatric Research
1994-	Ad hoc reviewer, Comprehensive Psychiatry
1999-	Editorial Board, Schizophr Res
1999-	Ad hoc review, Journal of the International Neuropsychological Society
2006-	Advisory Board, Acta Neuropsychiatrica
2006-	Editorial Board, Brain Imaging and Behavior

#### **Awards and Honors:**

1984	The 1902 Fellowship, Mount Holyoke College
1990	NARSAD Young Investigator Award
1994	NIMH First Award
1995	Alfred Pope Award, McLean Hospital
1996	NARSAD Young Investigator Award
2001	Scientific Advisory Board, Human Brain Mapping

## **PART II: Research, Teaching, and Clinical Contributions**

### **A. Narrative Report of Research, Teaching, and Clinical Contributions**

The focus of my research has been on the identification of brain abnormalities, particularly disruptions of the fronto-temporal network, which may represent risk factors for psychiatric illness or may be the site of primary pathology in these illnesses. Research studies have primarily included the application of neuropsychological measures, neurological hard signs, and magnetic resonance imaging methods completed both in patients and their well relatives. In recent years, this work has been extended by applying magnetic resonance techniques to study the effects of development on cortico-limbic networks in healthy children and adolescents. Additional ongoing studies have examined changes in these same networks produced by therapeutic antipsychotic drugs, as well as drugs of abuse. Future investigations will continue to examine the similarities and differences between functional cortical brain changes associated with pharmacotherapy of adult illness and healthy development.

### **B. Research Funding Information:**

#### **Current Research Support**

<b>Years Funded</b>	<b>Funding Source</b>	<b>Role</b>	<b>Grant Title</b>
<b>Federal Grants</b>			
2004-2009	NIMH/RO1	PI	fMRI of Frontal and Limbic Regions in Bipolar Patients
2004-2009	Department of Veterans Affairs	Co-I	Suicide and Suicidality in Veterans
2005-2010	NIMH/RO1	Co-PI	MRI-MRSI Studies of Bipolar Treatment Response
2006-2011	NIMH/PO1	Co-PI	Glutaminergic Dysfunction in Schizophrenia

## (fMRI and MRS Section)

2007-2009	NIDA/R21	PI	Brain Changes with Cannabis and Methamphetamine
2007-2009	NIDA/R21	Co-I	Marijuana and Mood: Frontal Predictors of Behavior
2007-2012	NIDA/R01	PI	MRS/fMRI Investigations of Adolescent Cannabis Use
2009-2013	Department of Veterans Affairs	PI	Neurobiology of Suicide Risk in Traumatic Brain Injury and Substance Abuse
<b>Pharmaceutical Grants</b>			
2005-2007	Janssen	PI	Recovery of Metabolic Function in Bipolar Patients Following Risperdal Contra Augmentation
2006-2007	Kyowa Hakko	PI	The Effect of Citicoline on the Brain in Healthy Adults, as Measured by fMRI and <sup>31</sup> P-MRS
2006-2009	Novartis	PI	Investigation of the Neurobiological Basis of CCK-4 Induced Panic in Humans
2009-2010	Kyowa Hakko	PI	Cognizin Citicoline: Effect on Cognition

**Past Research Support**

Years Funded	Funding Source	Role	Grant Title
<b>Federal Grants</b>			
1990-1995	NIMH/PO1	Co-PI	Biological Research in Schizophrenia: MRI Section (PI)
1991-1994	NIDA/R01	Co-PI	Neuropsychological Effects of Marijuana Use
1994-2000	NIMH/FIRST Award	PI	Proton Spectroscopy and Imaging in Schizophrenia
1996-2000	NIDA/R01	Co-PI	Residual Neuropsychological Effects of Marijuana
1996-2001	NIMH	Co-Inv	Frontal lobe structure and function in depressed adolescents
1997-1999	NIMH/R01	Co-PI	Obstetric Complications and Pathology in Bipolar Illness

1997-2001	Center for Disease Control	PI	Cognitive Function and Symptom Patterns in Gulf War Veterans (fMRI section)
1998-2001	CIA	PI	fMRI Study of the Neural Correlates of Deception (fMRI section)
1998-2003	NIMH/R01	Co-PI	Obstetric Complications and Pathology in Schizophrenia
1998-2003	NIMH/R01	Co-PI	Creativity and Liability in Schizophrenia
1998-2003	NIMH/R01	Co-PI	Brain Choline Uptake and Late Life Mental Illness
1999-2002	NIMH/P01	PI	Biological Research in Schizophrenia (fMRI Section)
1999-2003	NIMH/RO1	PI	Residual Cognitive Effects of Cannabis: An fMRI Study
2000-2005	NIMH/PO1	Co-PI	Glutamatergic Dysfunction in Schizophrenia (fMRI and MRS Section)
2002-2004	NIMH/R21	PI	Neural Correlates of Social Emotion in Major Depression (fMRI section)
2002-2004	NICH/RO3	PI	fMRI of Unconscious Affect Processing in Adolescents
<b>Private Grants</b>			
1986-1988	Scottish Rite Schizophrenia Program	Co-PI	Neurological Hard Signs in Schizophrenia
1992-1994	NARSAD Young Investigator Award	PI	Proton Spectroscopy of Schizophrenic Patients
1993-1994	Hood Foundation	Co-PI	Morphometric brain MRI in normal children
1993-1995	Scottish Rite Schizophrenia Program	PI	Cognitive Challenge Using Echo-Planar MRI
1995-1997	Stanley Foundation	Co-PI	Frontal Lobe Structure and Function in Depressed Adolescents
1996-1998	Hood Foundation	Co-PI	High Resolution MRI and fMRI in Normal Adolescents
1996-1998	NARSAD Young	PI	Echo Planar Imaging in the Temporal Lobes

	Investigator Award		of Schizophrenics
1999-2001	Hood Foundation	PI	Cortical fMRI Changes During Development In Children and Adolescents: fMRI studies
1999-2002	NAAR	PI	Applications of fMRI to the Study of Risk Factors in Autism
2001-2005	Hood Foundation	PI	Affective Learning in Children and Adolescents
2003-2005	International Institute for Borderline Studies	PI	Emotional Processing of Psychosocial Stimuli in Borderline Personality Disorder: An fMRI Study
<b>Pharmaceutical Grants</b>			
1987-1989	Eli Lilly	PI	Cognitive Effects of Fluoxetine Treatment
1994-1995	Interneuron Pharmaceuticals, Inc.	Co-PI	Proton MRS studies on the effects of CDP-choline in brain in vivo.
1995-1996	Bracco Diagnostics	Co-PI	Cerebral Blood Volume Mapping in Patients with Psychotic Disorders
1995-1996	Eli Lilly, Inc.	PI	fMRI Studies of Psychotic Patients Before and After Olanzapine Treatment
1997-1999	Pfizer, Inc.	PI	Comparison of Normal Controls and Schizophrenics on Ziprasidone using fMRI challenge paradigms
1999-2004	Eli Lilly, Inc	PI	Olanzapine vs. Lithium in Relapse Prevention in Bipolar Disorder
2002-2003	Repligen Corporation	PI	Effects of Secretin on Facial Affect: An fMRI Study
2002-2004	Eli Lilly, Inc	PI	Bipolar Health Outcomes

### C. Report of Current Research Activities

fMRI of Frontal and Limbic Regions in Bipolar Patients	PI
Glutamatergic Dysfunction in Schizophrenia (fMRI and MRS Section)	Co-PI
Brain Changes with Cannabis and Methamphetamine	PI
MRS/fMRI Investigations of Adolescent Cannabis Use	PI

Recovery of Metabolic Function in Bipolar Patients Following Risperdal Contingency Augmentation PI

The Effect of Citicoline on the Brain in Healthy Adults, as Measured by fMRI and <sup>31</sup>P-MRS PI

Investigation of the Neurobiological Basis of CCK-4 Induced Panic in Humans PI

#### **D. Report of Teaching**

##### **1. Local Contributions**

##### **a. Medical School Courses**

###### **1997**

Lecturer on the neurobiology of schizophrenia and functional neuroimaging Neurobiology Series,  
Tufts University / New England Medical Center  
30-40 fellows/session  
8-10 hours/year

###### **1998-2000**

Lecturer on the neurobiology of schizophrenia and cortical development  
Child psychiatry residents, Harvard Medical School  
8-12 residents/session  
10-12 hours/year

##### **b. Graduate Medical Courses**

###### **1996-1997**

Lecturer on neuropsychology  
psychiatry residents and neuroscience fellows at McLean Hospital  
8-10 residents/session  
12-16 hours/year

###### **1997**

Lecturer on neuroanatomy and functional neuroimaging  
Clinical Neuroscience Training Program, McLean Hospital  
20-30 students/session  
8-12 hours/year

###### **2000-2004**

Lecturer on MRS and fMRI in neuropsychiatric disorders  
Seminar in Neuroimaging, Boston University School of Medicine  
10-18 students/session  
8-10 hours/year



c. Local Invited Teaching Presentations

**1995-1996**

Lecturer on neuroimaging in psychotic disorders  
undergraduate and graduate students in the psychology department, Harvard University  
12-25 students/session  
10-15 hours/year

**1998**

Featured Speaker  
Whitehead Institute for Biomedical Research (MIT)  
Brain and Psyche: The Neurobiology of Self  
"Functional Brain Changes in Adolescence"  
Cambridge, MA

**2000**

Invited Speaker  
Harvard Medical School/Cambridge City Hospital  
Conference on Adolescent Self Destruction  
"The Neurobiology of Adolescent Behavior: fMRI Studies"  
Boston, MA

**2003**

Grand Rounds Presentation  
University of Massachusetts Medical School  
"fMRI of Psychiatric Disorders"  
Worcester, MA

**2003**

Invited Speaker  
Advanced Training Institute in Functional Magnetic Resonance Imaging (fMRI) at the Mass  
General Hospital's Martinos NMR Center in association with MIT and Harvard Medical School  
"Overview of Psychiatric Applications of Functional MRI"  
Charlestown, MA

d. Continuing Medical Education Courses

**2003**

Invited Speaker  
American Academy of Child and Adolescent Psychiatry  
"Neurobiology of Marijuana Use"  
Miami, FL

**2004**

Invited Speaker  
Neuroradiology Education and Research Foundation  
"Organization of Brain Function in Psychosis, Lessons from Functional Imaging"  
Seattle, WA

c. Advisory and Supervisory Responsibilities:

**1994-1995**

Jerry Lin, M.D./Ph.D. candidate, Harvard/MIT HST Program  
Faculty sponsor for AFAR Fellowship Award. Fellowship to study verbal memory processing in normal aging using functional magnetic resonance imaging.  
250 hours per year.

**1994-1995**

Hiroyu Hatano, A.B., M.D. candidate, Stanford University.  
Faculty supervisor, Psychology Faculty Prize, Harvard University. Supervision of senior honors thesis on correlations between brain metabolite concentrations and neuropsychological functioning in schizophrenia.  
150 hours per year.

**1994-1995, 1997-2001**

Staci Gruber, Ed.M, M.S., Ph.D. candidate in psychology, Tufts University.  
Supervision: Pre-doctoral research, applications of neuropsychology and neuroimaging in psychopathology. Advisor: Master's thesis, Doctoral thesis, fMRI studies of frontal functions. Tufts University Pre-doctoral Fellowship Award. Mentor/Sponsor for ISTART grant.  
250 hours per year.

**1994-2001**

Srinivasan Pillay, M.D. Postdoctoral fellow in structural MR imaging. Sponsor for Lilly Biol Psychiatry Travel Award. Post-doctoral fellow in fMRI of anxiety disorders. Mentor/Sponsor for NARSAD Young Investigator Award.  
150 hours per year.

**1995-1997**

Constance Moore, Ph.D. Postdoctoral fellow in psychiatric neuroimaging. Sponsor for International Congress on Schizophrenia Research Young Investigator Award.  
150 hours per year.

**1996-1997**

John Levine, M.D., Ph.D.  
Postdoctoral supervision. Supervised analyses and interpretation of fMRI data and clinical rating scales.  
50 hours per year.

**1997-1999**

Abigail Baird, M.A., Ph.D. candidate in psychology, Harvard University.  
Pre-doctoral research supervision in the application of fMRI techniques to the study of human cortical development. Sponsor for Health Emotions Research Institute, Smadar Levin Award.  
250 hours per year.

**1997-2004**

Russell Loeber, M.D./Ph.D. candidate in Behavioral Neuroscience, Boston University. Doctoral research advisor. Supervision in the application of blood volume neuroimaging techniques to the study of psychotropic medication on the cerebellum. Mentor/sponsor for NRSA Award. 300 hours per year.

**1997-1998**

Shelly Kapoor, B.S. Supervision of senior honors thesis on the application of blood volume techniques to the study of lateralized functional deficits in schizophrenia. Awarded highest honors by Tufts University. 150 hours per year.

**1997-1998**

Khashayar Vakili, B.S., M.A., M.D. candidate, Boston University. Master's thesis advisor. Supervision in the application of structural MR methods to the study of morphometric changes over time in depression. 125 hours per year.

**1997-2001**

Elizabeth Quattrocki, M.D., Ph.D. Postdoctoral fellow in the application of fMRI techniques to study nicotinic receptor activation in schizophrenia. Mentor/sponsor for NARSAD Young Investigator Award, DuPont-Warren Fellowship. 100 hours per year

**1999-2002**

Ika Rogowska, Ph.D. Assistant Professor, McLean Hospital. Mentor/sponsor for NARSAD Young Investigator Award for modeling fMRI data in psychotic disorders. 200 hours per year

**1999-2002**

Hadine Joffe, M.D. Postdoctoral fellow in the application of neuropsychological testing and functional imaging to the study of the effects of hormone replacement therapy. Mentor/sponsor for the Pfizer Fellowship Award in Women's Health (1999-2002). 25 hours per year

**1999-2002**

Matthew Belmonte, B.A., M.S., M.F.A., Ph.D. candidate in Behavioral Neuroscience, Boston University. Doctoral thesis advisor. Supervision in the application of fMRI methods to the study of abnormal spatial attention. 200 hours per year.

**2002-**

Isabelle Rosso, Ph.D. Postdoctoral fellow. Mentor/sponsor for NIMH K01 Award. 200 hours per year.

**2003-**

Marisa Silveri, Ph.D. Mentor/sponsor for NIAAA K01 Award.

200 hours per year.

**2003-**

Donna Murray, BMT, Ph.D. candidate in Behavioral Neuroscience Boston University. Doctoral Thesis Advisor.

50 hours per year.

2. Regional, National, and International Contributions

a. Invited Regional Presentations

**1994**

Invited Speaker

Society for Biological Psychiatry

"Echo Planar MRI of Schizophrenics and Normal Controls During Word Production"

Philadelphia, PA

**1996**

Invited Speaker

Society of Biological Psychiatry Meeting

"Neuropsychological Deficits in Marijuana Smokers"

New York, NY

**1996**

Plenary Session / Invited Panelist

Society of Biological Psychiatry Meeting

"Magnetic Resonance Imaging in Schizophrenia"

New York, NY

**1999**

Invited Speaker

Third International Congress on Bipolar Disorder

"fMRI Studies of Affect Recognition in Healthy Adolescents and Adults with Bipolar Disorder"

Philadelphia, PA

**2003**

Grand Rounds Presentation

New York University Child Study Center

"Neuroimaging in Healthy Adolescents"

New York, NY

**2004**

Invited Speaker

American Psychiatric Association

"Functional Neuroanatomy of Psychiatric Disorders"

New York, NY

**2004**

Invited Speaker

American Psychiatric Association,  
“Cognitive Functioning Outcomes: From First Episode to Functional Recovery”  
New York, NY

**2004**

Invited Speaker  
American Psychiatric Association  
“Optimizing Functional Outcome in Bipolar Disorder”  
New York, NY

b. Invited National Presentations

**1991**

Invited Speaker  
National Alliance for Research on Schizophrenia and Depression  
“Correlation of Frontal Lobe Anatomical Volume Loss with Behavioral Test Deficits in Chronic Schizophrenic Patients”  
Washington, DC

**1993**

Invited Speaker  
Society for Biological Psychiatry  
“<sup>1</sup>H MRS of N-Acetyl Aspartate in the Temporal Lobes in Schizophrenia”  
San Francisco, CA

**1994**

Invited Speaker  
Society for Personality Assessment  
“Neuropsychological Profiles Associated with Schizophrenia Spectrum Disorders”  
Chicago, IL

**1997**

Invited Speaker  
Society of Biol Psychiatry Meeting  
“Antipsychotic Drug Effects on fMRI in Schizophrenia”  
San Diego, CA

**1998**

Invited Speaker  
College on Problems of Drug Dependence Annual Meeting  
“Residual Effects of Marijuana Use: An fMRI Study”  
Scottsdale, AZ

**1998**

Workshop / Invited Panelist  
National Institute on Aging  
“fMRI of Residual Effects of Marijuana in Middle Aged Subjects”  
Washington, DC

**1999**

Invited Speaker

National Institute of Child Health and Human Development/National Institute of Mental Health/National Institute of Neurological Disorders and Stroke/Inter-Institute Invitational Conference

“Overview of Current work in fMRI: Affect and Emotion”

Leesburg, VA

**1999**

Invited Speaker

National Institute on Drug Abuse, National Institutes of Health

“fMRI Studies of Adolescent and Adult Subjects”

Rockville, MD

**1999**

Invited Speaker

American Academy of Child and Adolescent Psychiatry

“Functional MRI Studies in Healthy Adolescents and Adults with Bipolar Disorder”

Chicago, IL

**2001**

Invited Speaker

Society of Biological Psychiatry

“Integrating Clinical Measures with Functional Neuroimaging to Clarify the Neurophysiology of Bipolar Disorder.

New Orleans, LA

**2001**

Invited Speaker

National Institute on Alcohol Abuse

“Application of Neuroimaging Techniques to the Study of Brain Functions in Adolescents”

Bethesda, MD

**2001**

Invited Speaker

American Psychological Association

“Developmental changes in Frontal-Amygdala Response: Substance Abuse Treatment Implications”

San Francisco, CA

**2001**

Invited Speaker

Society for Neuroscience 31<sup>st</sup> Meeting

“Altered Frontal Activation Patterns in Abstinent Long Term Marijuana Smokers: A BOLD fMRI Study”

San Diego, CA

**2002**

Invited Speaker  
Psychiatric Research Society  
"Corticolimbic Activation in Adolescence and Adulthood: Implications for Eating Disorders"  
Salt Lake City, UT

**2002**

Invited Speaker  
National Institute of Drug Abuse Symposium: Adolescent Decision Making: Proximal Processes  
in Adolescent Drug Abuse  
"Neurobiological Changes During Adolescent Development: MR Findings"  
Bethesda, MD

**2002**

Invited Speaker  
International Meeting for Autism Research  
"Prefrontal Activation During the Perception of Negative Emotion in Children and Adolescents"  
Orlando, FL

**2002**

Invited Speaker  
National Institute of Mental Health  
Neurobiology of Bipolar Disorder: Research Workshop  
Bethesda, MD

**2004**

Invited Speaker  
University of California Davis  
"Age-Related Changes in Frontal Executive Function"  
Davis, CA

**2004**

Invited Speaker  
National Institute of Mental Health  
"Adolescents, the Amygdala and Emotional Information Processing"  
Bethesda, MD

**2005**

Invited Speaker  
National Institute of Mental Health  
"Human Adolescent Brain Development"  
Bethesda, MD

**2005**

Invited Keynote Speaker  
Society for Neuroscience  
"Emotional and Cognitive Changes Associated With Adolescent Development"  
Washington, DC

**2006**

Invited Speaker

Sponsored by NIDA, NIMH, NICHD, and NINDS

Reward Neurocircuitry in Adolescent Development and Decision Making

“Developmental Changes in Response to Food Stimuli”

Bethesda, MD

**2006**

Invited Speaker

Sponsored by NIDA and NIAAA

Consequences of Marijuana Use on Brain and Behavioral Development

“Brain Development: Challenges for Marijuana Neuroimaging Studies”

Bethesda, MD

**2007**

Invited Speaker

American Psychiatric Association

Sponsored by NIDA

Insights on Obesity and Drug Addiction from Brain Imaging

“Modulators of Orbitofrontal Activation in Response to Food Stimuli”

San Diego, CA

c. Invited International Presentations

**1994**

Invited Speaker

American College of Neuropsychopharmacology Annual Meeting

“Functional MRI of Schizophrenics and Normal Controls During Word Production”

San Juan, Puerto Rico

**1995**

Invited Speaker

Formation et Recherche en Neurosciences Appliquees a la Psychiatrie

“1H Spectroscopy of the Temporal Lobes in Schizophrenic and Bipolar Patients”

Rouffach, France

**1995**

Invited Speaker

Formation et Recherche en Neurosciences Appliquees a la Psychiatrie

“Echo Planar MRI of Schizophrenics and Normal Controls During Word Production”

Rouffach, France

**1995**

Invited Speaker

American College of Neuropsychopharmacology Annual Meeting

“Sex Differences in fMRI Activation for Language Processes in Schizophrenic Patients and Controls”

San Juan, Puerto Rico



**1995**

Invited Speaker  
American College of Neuropsychopharmacology Annual Meeting  
"Proton Spectroscopy in Schizophrenia"  
San Juan, Puerto Rico

**1996**

Plenary Session /Invited Panelist  
World Psychiatric Association  
"fMRI Studies of Altered Brain Activation During Verbal Memory Tasks in Schizophrenia"  
Madrid, Spain

**1996**

Plenary Session/ Invited Panelist  
American College of Neuropsychopharmacology Annual Meeting: Human Brain Development  
"MR Spectroscopy in Children and Adolescents"  
San Juan, Puerto Rico

**1997**

Invited Speaker  
European Winter Conference on Brain Research  
"Obsessive-Compulsive Disorder Among Schizophrenic Patients: An Exploratory Study using Functional Magnetic Resonance Imaging Data"  
Les Arcs, France

**1997**

Invited Speaker  
"Antipsychotic Drug Effects on Cortical Activation, as Measured by fMRI in Schizophrenia"  
San Juan, Puerto Rico

**1997**

Invited Speaker  
American College of Neuropsychopharmacology Annual Meeting  
"Magnetic Resonance Studies of Drug Effects in Man"  
San Juan, Puerto Rico

**1998**

Invited Speaker  
American College of Neuropsychopharmacology Annual Meeting  
"fMRI of Cortical Changes in Bipolar Disorder: BOLD and DSCMRI Studies"  
San Juan, Puerto Rico

**1998**

Invited Speaker  
American College of Neuropsychopharmacology Annual Meeting  
"MRS Studies of Brain Biochemistry During Childhood in Health and in Neuropsychiatric Illness"  
San Juan, Puerto Rico

**2002**

Invited Speaker

American College of Neuropsychopharmacology

"Differential Activation in Bipolar Patients During Emotional and Cognitive Processing"

San Juan, PR

**2003**

Invited Speaker

"Advances in Treatment and Diagnosis in Child and Adolescent Psychiatry"

Canadian Academy of Child and Adolescent Psychiatry, Halifax, Canada

**2004**

Invited Speaker

Scandinavian College of Neuropsychopharmacology Annual meeting

"Impact of Neurocognitive Status on Future Functioning in Schizophrenia and Bipolar Disorder"

Juan Les Pins, France

**2005**

Invited Speaker

Annual Meeting of the Finnish Psychiatric Association

"Cognitive Functioning in Bipolar Disorder"

Helsinki, Finland

**2006**

Invited Speaker

WPA International Congress: New Insights on the Pathophysiology of Bipolar Disorder

"Corticolimbic fMRI Activation in Bipolar Disorder During Viewing of Fearful Facial Affect"

Istanbul, Turkey

d. Professional and educational leadership role related to teaching

**2001**

International Congress on Schizophrenia Research

Invited Chair for Symposium

"Functional Neuroimaging"

Whistler, British Columbia

**2002**

Invited Speaker

Suffolk Law School,

Fourth Annual Juvenile Justice Conference: Applying Behavioral Science to Juvenile Advocacy

"Corticolimbic Activation in Adolescence and Adulthood"

Boston, MA

**2003**

Blending Conference Workshop

Invited Speaker

"Craving, Decision Making, and Addiction: What Does New Knowledge about the Brain tell us about Treatment?"

Westminister, CO

### PART III. BIBLIOGRAPHY:

#### Original reports:

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17. Hudson JI, Pope HG, Jonas JM, Yurgelun-Todd DA, Frankenburg FR. A controlled family history study of bulimia. *Psychol Med* 1987;17(4):883-90.
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#### **Reviews, Chapters, and Editorials:**

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#### **Letters to the Editor**

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#### **Abstracts**

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